Chapter 1

Preliminaries

1.1 Preliminaries

Multisets

A **Multiset** M with **underlying set** S is a set of ordered pairs

$$M = \{(s_i, n_i) | s_i \in S, n_i \in \mathbb{Z}^+, s_i \neq s_j \forall i \neq j\}$$

Matrices

$\mathcal{M}_{m,n}(F)$: the set of $m \times n$ matrices.
Properties of transpose:

1. $(A^T)^T = A$
2. $(A + B)^T = A^T + B^T$
3. $(rA)^T = rA^T \ \forall r \in F$
4. $(AB)^T = B^T A^T$